

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P922099

Luminaire Tested: DFN2DIP-PN3F0-040D090US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922099  
REPORT IS A COMBINATION OF REPORTS P901118 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-040D090US940-RLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

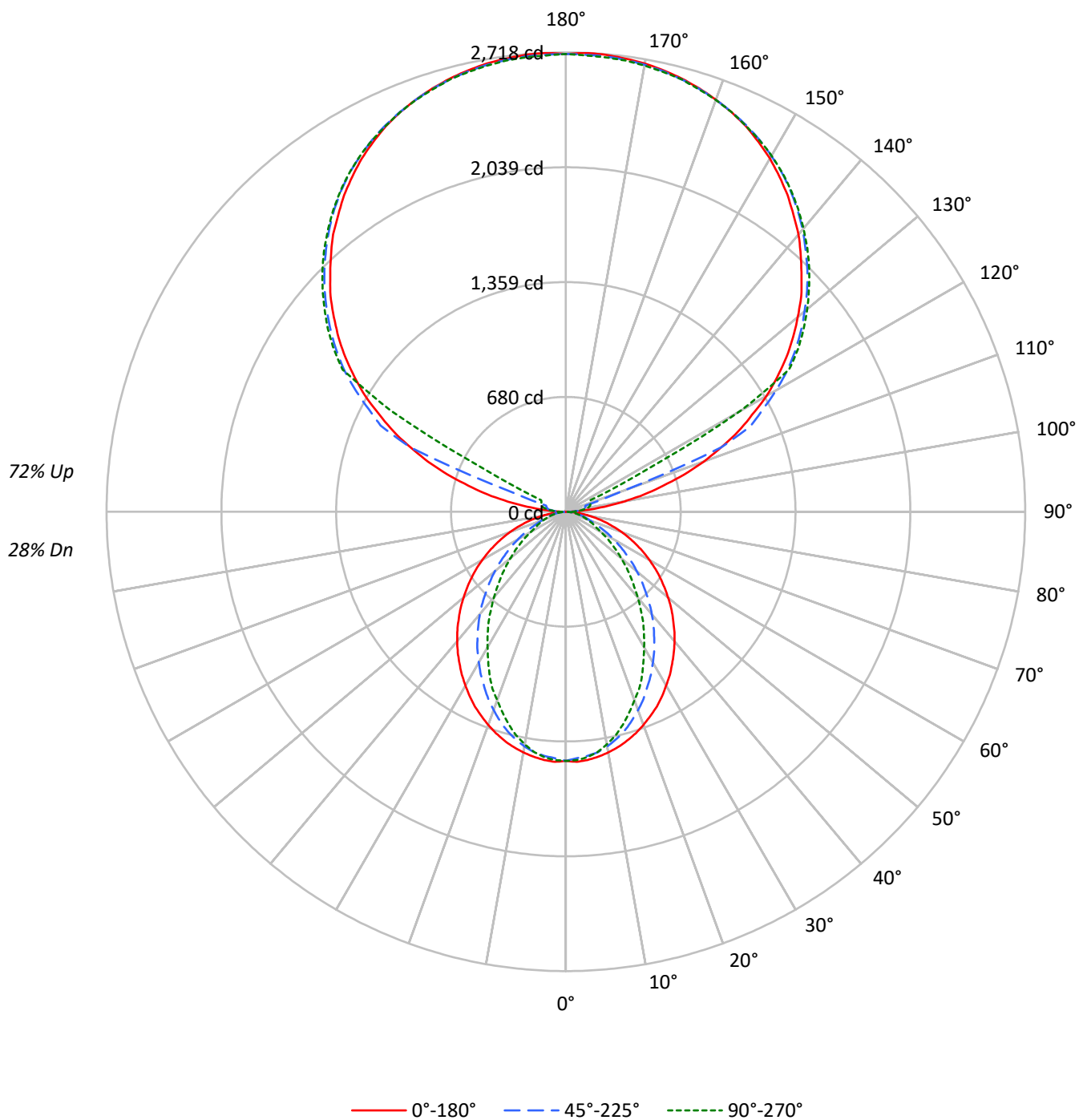
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10976.9 lumens  
Efficiency: N/A  
Efficacy: 103.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 105.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 102 | 102 | 102 | 102 | 91 | 91 | 91 | 91 | 71 | 71 | 71 | 53 | 53 | 53 | 36 | 36 | 36 |
| 1   | 93  | 89  | 85  | 82  | 83 | 80 | 77 | 74 | 62 | 60 | 59 | 46 | 45 | 44 | 32 | 31 | 31 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 41 | 39 | 37 | 28 | 27 | 26 |
| 3   | 78  | 69  | 62  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 25 | 24 | 22 |
| 4   | 71  | 61  | 53  | 48  | 63 | 55 | 48 | 44 | 43 | 39 | 35 | 33 | 30 | 27 | 23 | 21 | 20 |
| 5   | 65  | 54  | 47  | 41  | 58 | 49 | 42 | 37 | 39 | 34 | 30 | 29 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 49  | 41  | 35  | 54 | 44 | 37 | 32 | 35 | 30 | 27 | 27 | 23 | 21 | 19 | 17 | 15 |
| 7   | 55  | 44  | 36  | 31  | 49 | 40 | 33 | 28 | 32 | 27 | 23 | 24 | 21 | 18 | 17 | 15 | 14 |
| 8   | 51  | 40  | 32  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 22 | 26 | 22 | 19 | 20 | 17 | 15 | 15 | 13 | 11 |
| 10  | 45  | 33  | 26  | 22  | 40 | 30 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 13 | 14 | 12 | 10 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1723 | 1723 | 1723 |
| 5°  | 1725 | 1695 | 1706 |
| 10° | 1707 | 1660 | 1650 |
| 15° | 1682 | 1604 | 1563 |
| 20° | 1650 | 1527 | 1457 |
| 25° | 1617 | 1442 | 1355 |
| 30° | 1574 | 1354 | 1226 |
| 35° | 1531 | 1259 | 1112 |
| 40° | 1487 | 1162 | 982  |
| 45° | 1436 | 1054 | 864  |
| 50° | 1383 | 945  | 749  |
| 55° | 1328 | 828  | 638  |
| 60° | 1265 | 707  | 525  |
| 65° | 1191 | 584  | 471  |
| 70° | 1102 | 469  | 425  |
| 75° | 990  | 410  | 385  |
| 80° | 827  | 340  | 332  |
| 85° | 562  | 221  | 245  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1826 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 138.2   | 1.3       |
| 10°-20°   | 379.3   | 3.5       |
| 20°-30°   | 532.5   | 4.9       |
| 30°-40°   | 580.5   | 5.3       |
| 40°-50°   | 533.5   | 4.9       |
| 50°-60°   | 419.0   | 3.8       |
| 60°-70°   | 272.7   | 2.5       |
| 70°-80°   | 140.4   | 1.3       |
| 80°-90°   | 40.6    | 0.4       |
| 90°-100°  | 89.3    | 0.8       |
| 100°-110° | 332.9   | 3.0       |
| 110°-120° | 883.0   | 8.0       |
| 120°-130° | 1464.5  | 13.3      |
| 130°-140° | 1555.6  | 14.2      |
| 140°-150° | 1445.8  | 13.2      |
| 150°-160° | 1162.4  | 10.6      |
| 160°-170° | 749.0   | 6.8       |
| 170°-180° | 257.8   | 2.3       |
| 0°-30°    | 1049.9  | 9.6       |
| 0°-40°    | 1630.4  | 14.9      |
| 0°-60°    | 2582.9  | 23.5      |
| 0°-90°    | 3036.6  | 27.7      |
| 90°-120°  | 1305.2  | 11.9      |
| 90°-150°  | 5771.2  | 52.6      |
| 90°-180°  | 7940.0  | 72.3      |
| 0°-180°   | 10976.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1474 | 1474  | 1474 | 1474  | 1474 |      |
| 5°   | 1474 | 1468  | 1450 | 1462  | 1458 | 140  |
| 15°  | 1402 | 1387  | 1342 | 1317  | 1304 | 395  |
| 25°  | 1273 | 1230  | 1142 | 1087  | 1067 | 585  |
| 35°  | 1097 | 1029  | 911  | 827   | 798  | 686  |
| 45°  | 896  | 807   | 667  | 572   | 540  | 692  |
| 55°  | 682  | 578   | 434  | 354   | 328  | 609  |
| 65°  | 460  | 352   | 232  | 187   | 183  | 456  |
| 75°  | 245  | 152   | 107  | 97    | 96   | 260  |
| 85°  | 57   | 29    | 25   | 25    | 25   | 66   |
| 90°  | 2    | 24    | 39   | 49    | 53   | 10   |
| 95°  | 127  | 63    | 76   | 86    | 84   | 151  |
| 105° | 596  | 655   | 120  | 141   | 149  | 637  |
| 115° | 1127 | 1160  | 1209 | 302   | 161  | 1109 |
| 125° | 1593 | 1619  | 1656 | 1670  | 1676 | 1421 |
| 135° | 1972 | 2003  | 2020 | 2040  | 2036 | 1523 |
| 145° | 2287 | 2285  | 2318 | 2332  | 2322 | 1431 |
| 155° | 2518 | 2501  | 2524 | 2536  | 2520 | 1161 |
| 165° | 2654 | 2642  | 2648 | 2662  | 2648 | 750  |
| 175° | 2714 | 2700  | 2705 | 2718  | 2699 | 258  |
| 180° | 2708 | 2708  | 2708 | 2708  | 2708 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1474.2 | 1474.2 | 1474.2 | 1474.2 | 1474.2 |
| 2.5°   | 1480.9 | 1474.2 | 1459.5 | 1472.9 | 1470.2 |
| 5°     | 1474.2 | 1467.5 | 1450.1 | 1462.1 | 1458.2 |
| 7.5°   | 1462.1 | 1454.2 | 1435.6 | 1440.7 | 1434.1 |
| 10°    | 1446.2 | 1436.8 | 1410.2 | 1406.0 | 1398.2 |
| 12.5°  | 1426.2 | 1414.2 | 1378.0 | 1370.1 | 1355.4 |
| 15°    | 1402.1 | 1387.4 | 1342.1 | 1316.8 | 1303.5 |
| 17.5°  | 1374.1 | 1352.7 | 1296.6 | 1267.4 | 1246.0 |
| 20°    | 1342.1 | 1315.4 | 1248.7 | 1215.4 | 1186.0 |
| 22.5°  | 1307.4 | 1276.8 | 1199.3 | 1154.0 | 1134.1 |
| 25°    | 1272.7 | 1230.0 | 1141.9 | 1087.4 | 1067.2 |
| 27.5°  | 1231.5 | 1186.0 | 1088.6 | 1025.9 | 995.1  |
| 30°    | 1187.4 | 1136.6 | 1029.8 | 961.9  | 925.9  |
| 32.5°  | 1144.7 | 1083.2 | 973.9  | 893.9  | 860.4  |
| 35°    | 1096.7 | 1028.6 | 911.2  | 827.2  | 797.7  |
| 37.5°  | 1050.0 | 976.5  | 852.5  | 760.4  | 727.1  |
| 40°    | 1000.6 | 920.6  | 791.1  | 696.4  | 661.7  |
| 42.5°  | 949.8  | 864.5  | 729.8  | 631.0  | 597.7  |
| 45°    | 896.5  | 807.1  | 667.1  | 572.3  | 540.3  |
| 47.5°  | 845.9  | 751.2  | 607.1  | 512.3  | 483.0  |
| 50°    | 789.8  | 695.1  | 548.3  | 456.2  | 428.3  |
| 52.5°  | 735.0  | 635.0  | 492.3  | 404.2  | 378.9  |
| 55°    | 681.7  | 577.6  | 433.5  | 353.6  | 328.2  |
| 57.5°  | 627.1  | 520.3  | 381.6  | 306.8  | 285.5  |
| 60°    | 571.0  | 464.2  | 326.8  | 258.9  | 237.6  |
| 62.5°  | 516.4  | 409.7  | 280.1  | 216.2  | 205.5  |
| 65°    | 460.3  | 352.1  | 232.1  | 186.8  | 182.7  |
| 67.5°  | 407.0  | 298.8  | 186.8  | 164.1  | 160.1  |
| 70°    | 350.9  | 246.8  | 154.7  | 141.4  | 136.0  |
| 72.5°  | 297.6  | 198.8  | 129.4  | 118.8  | 116.1  |
| 75°    | 245.4  | 152.0  | 106.7  | 97.4   | 96.1   |
| 77.5°  | 193.5  | 108.0  | 84.1   | 78.7   | 76.0   |
| 80°    | 145.3  | 77.4   | 63.9   | 58.8   | 58.8   |
| 82.5°  | 101.4  | 52.1   | 44.1   | 41.3   | 41.3   |
| 85°    | 57.3   | 29.3   | 25.3   | 25.3   | 25.3   |
| 87.5°  | 21.4   | 10.6   | 10.6   | 9.4    | 9.4    |
| 90°    | 1.9    | 23.5   | 39.1   | 49.1   | 52.8   |
| 92.5°  | 49.1   | 41.2   | 47.0   | 51.0   | 52.8   |
| 95°    | 127.3  | 62.6   | 76.3   | 86.3   | 84.3   |
| 97.5°  | 229.3  | 68.7   | 99.9   | 105.8  | 107.7  |
| 100°   | 347.0  | 78.5   | 111.7  | 127.3  | 131.3  |
| 102.5° | 476.2  | 472.4  | 115.7  | 137.1  | 143.1  |
| 105°   | 595.8  | 654.7  | 119.6  | 141.1  | 148.9  |
| 107.5° | 734.9  | 783.8  | 123.6  | 145.0  | 152.9  |
| 110°   | 868.3  | 909.3  | 343.0  | 147.0  | 154.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 993.7  | 1028.9 | 995.6  | 150.8  | 156.9  |
| 115°   | 1126.9 | 1160.1 | 1209.2 | 301.8  | 160.8  |
| 117.5° | 1242.5 | 1281.7 | 1315.1 | 1034.7 | 521.3  |
| 120°   | 1371.9 | 1401.2 | 1436.6 | 1460.1 | 1195.5 |
| 122.5° | 1481.6 | 1513.0 | 1552.3 | 1563.9 | 1566.0 |
| 125°   | 1593.2 | 1618.8 | 1656.1 | 1669.8 | 1675.6 |
| 127.5° | 1695.1 | 1722.6 | 1752.2 | 1771.7 | 1773.6 |
| 130°   | 1791.3 | 1822.7 | 1844.1 | 1865.7 | 1863.9 |
| 132.5° | 1889.3 | 1914.9 | 1936.3 | 1954.0 | 1952.1 |
| 135°   | 1971.7 | 2003.0 | 2020.5 | 2040.3 | 2036.4 |
| 137.5° | 2057.8 | 2081.3 | 2101.0 | 2120.6 | 2114.8 |
| 140°   | 2142.0 | 2157.8 | 2179.3 | 2196.9 | 2187.2 |
| 142.5° | 2212.8 | 2226.5 | 2251.8 | 2267.4 | 2257.7 |
| 145°   | 2287.2 | 2285.1 | 2318.4 | 2332.2 | 2322.4 |
| 147.5° | 2351.7 | 2345.9 | 2379.2 | 2389.0 | 2381.2 |
| 150°   | 2414.6 | 2400.8 | 2432.2 | 2443.8 | 2434.1 |
| 152.5° | 2467.4 | 2451.8 | 2481.1 | 2493.0 | 2479.2 |
| 155°   | 2518.4 | 2500.9 | 2524.3 | 2536.0 | 2520.4 |
| 157.5° | 2559.6 | 2544.0 | 2561.6 | 2575.3 | 2559.6 |
| 160°   | 2594.9 | 2583.0 | 2594.9 | 2606.6 | 2592.8 |
| 162.5° | 2626.1 | 2614.4 | 2624.2 | 2637.9 | 2620.3 |
| 165°   | 2653.6 | 2641.9 | 2647.8 | 2661.5 | 2647.8 |
| 167.5° | 2675.2 | 2663.4 | 2669.3 | 2683.1 | 2665.4 |
| 170°   | 2692.9 | 2681.0 | 2684.9 | 2698.7 | 2681.0 |
| 172.5° | 2704.6 | 2692.9 | 2696.8 | 2710.5 | 2692.9 |
| 175°   | 2714.3 | 2700.5 | 2704.6 | 2718.2 | 2698.7 |
| 177.5° | 2718.2 | 2704.6 | 2706.6 | 2720.3 | 2702.7 |
| 180°   | 2708.5 | 2708.5 | 2708.5 | 2708.5 | 2708.5 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |      |       |       |       |                |      |      |      |      |
|-----------------|------|------------------|------|-------|-------|-------|----------------|------|------|------|------|
| Ceiling         |      | 0.7              | 0.7  | 0.5   | 0.5   | 0.3   | 0.7            | 0.7  | 0.5  | 0.5  | 0.3  |
| Wall            |      | 0.5              | 0.3  | 0.5   | 0.3   | 0.3   | 0.5            | 0.3  | 0.5  | 0.3  | 0.3  |
| Reference plane |      | 0.2              | 0.2  | 0.2   | 0.2   | 0.2   | 0.2            | 0.2  | 0.2  | 0.2  | 0.2  |
| Room dimensions |      | Viewed crosswise |      |       |       |       | Viewed endwise |      |      |      |      |
| X=2H            | Y=2H | 6.44             | 7.11 | 7.57  | 8.23  | 9.79  | 2.40           | 3.08 | 3.53 | 4.20 | 5.76 |
|                 | 3H   | 8.10             | 8.70 | 9.24  | 9.83  | 11.40 | 3.57           | 4.18 | 4.71 | 5.31 | 6.88 |
|                 | 4H   | 8.69             | 9.27 | 9.84  | 10.40 | 11.98 | 4.01           | 4.58 | 5.16 | 5.71 | 7.29 |
|                 | 6H   | 9.10             | 9.63 | 10.26 | 10.76 | 12.35 | 4.32           | 4.85 | 5.48 | 5.98 | 7.57 |
|                 | 8H   | 9.22             | 9.72 | 10.38 | 10.87 | 12.45 | 4.40           | 4.90 | 5.56 | 6.05 | 7.64 |
|                 | 12H  | 9.27             | 9.75 | 10.44 | 10.89 | 12.50 | 4.44           | 4.91 | 5.60 | 6.05 | 7.66 |
| 4H              | 2H   | 6.43             | 7.01 | 7.59  | 8.14  | 9.72  | 2.97           | 3.55 | 4.13 | 4.68 | 6.26 |
|                 | 3H   | 8.24             | 8.72 | 9.40  | 9.87  | 11.47 | 4.30           | 4.78 | 5.46 | 5.94 | 7.53 |
|                 | 4H   | 8.92             | 9.36 | 10.09 | 10.51 | 12.12 | 4.84           | 5.28 | 6.00 | 6.42 | 8.04 |
|                 | 6H   | 9.42             | 9.80 | 10.59 | 10.97 | 12.57 | 5.24           | 5.62 | 6.41 | 6.79 | 8.39 |
|                 | 8H   | 9.59             | 9.94 | 10.76 | 11.10 | 12.72 | 5.37           | 5.72 | 6.54 | 6.88 | 8.49 |
|                 | 12H  | 9.68             | 9.99 | 10.86 | 11.16 | 12.79 | 5.42           | 5.74 | 6.61 | 6.91 | 8.53 |
| 8H              | 4H   | 8.88             | 9.23 | 10.05 | 10.39 | 12.00 | 5.11           | 5.46 | 6.27 | 6.61 | 8.23 |
|                 | 6H   | 9.43             | 9.72 | 10.62 | 10.92 | 12.54 | 5.61           | 5.90 | 6.80 | 7.10 | 8.72 |
|                 | 8H   | 9.64             | 9.89 | 10.84 | 11.07 | 12.71 | 5.80           | 6.05 | 6.99 | 7.23 | 8.86 |
|                 | 12H  | 9.77             | 9.99 | 10.97 | 11.17 | 12.84 | 5.90           | 6.12 | 7.10 | 7.30 | 8.97 |
| 12H             | 4H   | 8.82             | 9.14 | 10.01 | 10.31 | 11.93 | 5.10           | 5.42 | 6.29 | 6.59 | 8.21 |
|                 | 6H   | 9.41             | 9.66 | 10.60 | 10.84 | 12.47 | 5.66           | 5.91 | 6.85 | 7.09 | 8.72 |
|                 | 8H   | 9.61             | 9.84 | 10.81 | 11.01 | 12.68 | 5.86           | 6.08 | 7.05 | 7.25 | 8.92 |

END OF REPORT